The ART ◆ of CHESS ◇

Since the beginning of the mechanical age people have been fascinated by the possibility of machines replacing human functions. To some it represented the release from human drudgery, both manual and intellectual. To others a more philosophical challenge was in sight in the attainment of machine decisions, machine imagination, machine thought. In retrospect it is obvious that these two aims were related; the thinking machine of one age became the drudge replacing automaton of the next. A brief look at the history of the calculator, from abacus to the modern electronic variety, soon reveals that as soon as a so called 'intelligent' machine has been produced then the very definition of 'intelligence' changes. 'Intelligence' seems to be a word applied to all functions which a human can achieve and machines cannot. Perhaps one day this process will restrict the word to such a limited range as to become meaningless.

For many years the fascination of this subject has been concentrated upon the advent of chess playing machines, and with good reason. Chess has always been respected as a formidable human accomplishment yet many aspects of the game (though not yet all) are susceptible to analysis consisting of many repetitive calculations, well suited to computers and their forerunners. This leads to a situation where man and machine can be pitted against each other on fairly equal terms. There is certainly never any lack of human players eager to undertake this challenge, which is often seen as one of defending the pride of the human race.

As yet our finest chess players still persist in beating our best chess computer, despite the latter's horrifying amount of processing power. It seems that these players possess an insight into the game beyond the realms of mere number crunching, an insight that provides a new challenge to the designers of chess programs. When this challenge is met then it will provide the final chapter to a history that began (albeit in a dubious fashion) nearly two hundred years ago.

Baron Von Kempelen — TURK

It will probably come as a surprise to most people that the first chess playing machine was produced in the eighteenth century, long before the advent of computers, or even complicated mechanical devices. It was invented by the Baron Von Kempelen and was very successful, beating many of the best players of its time, and even winning against Napoleon (a fairly dangerous manoeuvre as he was not known as a good loser). The machine, called TURK, consisted of a mechanical man which moved pieces on a board in response to an opponents moves. It was very popular, toured many countries, and entertained most of the royalty of the day.

Unfortunately TURK had one drawback, it was a clever fake. It was a cunningly designed device with cabinets below in which a human player could hide from view. As the box was opened up, one side at a time, the human player moved to hide from the sight of spectators. Lever controls were provided to operate the machine's mechanical arm and the player could see the board through a veil in the mechanical man's chest. It had however no intelligence of its own but various of the (smaller) chess players of the time hidden within. Fake though it was TURK did illustrate the public interest produced by any machine that could claim to think.

Leonardo Torres y Quevedo

In the Polytechnic University of Madrid can be found, still working, the true ancestor of the chess playing computer. It is not very ambitious in its aims, but considering that it was built in 1890 and uses only electro mechanical devices then it is worthy of admiration. Its inventor was the Spanish scientist Leonardo Torres y Quevedo whose experiments and theories on automation led him to produce this as an example of the possibilities of robots.

The object of the device was to checkmate a human opponent's king using only its own king and rook. It consisted of a board on which the three pieces moved along slots. Electrical connections made by the

preces m their various positions served to sense the current board position and electromagnets provided the means of moving the chess preces A light bulb lit up if the human player had made an illegal move and a device similar to an early gramophone produced the words CHECK and MATE where appropriate

Decision making was performed by a series of electromagnetic relay switches It had no software control as such the device being analogous to a modern microprocessor constructed to respond only to an instruction set of (simple) chessboard positions The embedded rules determining which moves to make were not complicated consisting of six conditions concerning relative positions of Kings and Rook on which six actions could be taken It could guarantee a checkmate within 63 moves against any opponent

Alan Matheson Turing

We had to wait another fifty years before a step comparable to that of Torres was made Alan Turing was both mathematician and philosopher whose short (and often unhappy) life founded both computer science and artificial intelligence research In 1951 Turing wrote what was probably the first chess program TURBOCHAMP Unfortunately there did not exist a computer capable of running TURBOCHAMP The first game played between chess program and human was executed by a human (Turing himself) performing the program s calculations (without the aid of a calculator) The human opponent was Allick Glennis who was not a particularly good player but who managed to checkmate TURBOCHAMP after 29 moves The game lasted three hours

TURBOCHAMP was a rudimentary program by today's standards in that it could only look one move ahead It had no concept of the difference between the opening middle and end games, and had an elementary evaluation of position It did however understand the rules of the game and used basic algorithms distinguishable from the modern variety only by the need to produce an answer within many fewer calculations It is interesting to note that as Alan Turing was a poor chess player TURBOCHAMP was probably an example of a program being able to out think its creator

Claude Elwood Shannon

Claude Elwood Shannon was working on his theories of chess programming almost simultaneously with Alan Turing He formalised the methods that can be used to consider a chess position into two strategies, generally known as strategy A and strategy B These two methods form the basis of practically all modern chess programs Both strategies were developed on the basis of work done several years earlier by the mathematician Jon Van Neumann He developed the methods of minimax to evaluate the optimum path through a decision tree as part of his general theories on game playing

STRATEGY A

This is sometimes known as the Brute Force Method In its initial conception it simply involved the calculation of every possible move and every possible reply for a fixed number of half moves ahead This has been refined in later years to include alpha beta cutoff in the minimax search and to perform heuristic ordering of evaluation of moves to improve efficiency To work effectively this method requires computers of high processing power due to the alarming way in which the number of computations required rises as the look ahead increases

STRATEGY B

As Shannon realised that the computers of his day were incapable of utilising strategy A with much effect he devised strategy B as a more subtle alternative The essential difference is that a heuristic plausible move generator is used to cut down the number of moves considered at each stage and hence increases the number of half moves ahead that can be analysed This method has the disadvantage of the possibility of missing a vital move if the plausible move generator is not of the highest standard It does however provide the more modest computer the chance of finding a move reasonably sound for several moves ahead

Shannon never actually wrote a full program to perform either of his strategies but set down algorithms used from then on by many chess programs He demonstrated a deep understanding of the limiting factors which were to pose the problems for chess programmers for many years to come

Los Alamos — MANIAC 1

One of the very early chess programs running on a computer was developed in the early 1950 s by a group at the Los Alamos Scientific Laboratory New Mexico This was presumably a form of relaxation after their efforts in producing the first hydrogen bomb The scientists, Wells, Walden, Kister, Stein and Ulam developed their program on the 30 ton IBM monster MANIAC 1 In trying to cut down the explosion of computations they cheated a little by programming for a 6 by 6 chess board without bishops

This program was firstly beaten by a fairly strong player despite the program being given an initial queen advantage It then went on to face a very specially prepared challenger A young member of the laboratory who had been taught to play chess only a week earlier was thrown into the fray and was unsurprisingly beaten after 23 moves History does not record the name of this challenger but she gained the doubtful honour of being the first to be outwitted at chess by a computer

Modern Chess Programs

As true computers recognisable as the ancestors of our current machines, were developed in the early 1960 s the race to produce the ultimate chess program was on and still continues today In 1974 the internal skirmishes between chess computers were formalised at the first world computer chess championship in Stockhlm The top computers available played each other under tournament rules (with a few amendments to cope with system failures) A Russian program KAISSA won the first of what was to become a regular event Since then competition has also extended to a microcomputer event which tends to be more of a test of programming than processing power

The race has always been a three way challenge between the computers themselves and between computers and chess players The progress of the computers and their programming can be traced through the increasing standard of players required to defeat them From novice in the 1950 s through to master in the 1980 s it seems that the humans are fighting a losing battle Perhaps so but the final stages of the war may well last longer than expected

Chess is the oldest stylised strategy game known to the modern world It is a game for two players and is played on an eight by eight board with 16 white pieces and 16 black pieces (usually known as men) The horizontal rows of board squares are known as ranks and the vertical rows as files At the beginning of a game, men and board are set up as in **fig 1** The lower right hand square is always white and the Queens occupy squares of their own colour

The ultimate goal in chess is to 'checkmate' the opponent's King While the King is never captured and removed from the field of play it can be attacked (checked) and threatened with capture When this happens, the King must extricate himself immediately If this is not possible, the King has been checkmated The side which finds itself in checkmate loses the game

MOVES OF THE MEN

The players take turns with white making the first move One may may be moved at each turn, except in the case of 'castling' (see **Special Moves**) All pieces except the Knight move only along unblocked lines If a piece belonging to one player can move to a square occupied by one of his opponent's pieces, he may capture the piece and take its place on the square The captured piece is removed from the board The Knight is the only man that can jump over the other men

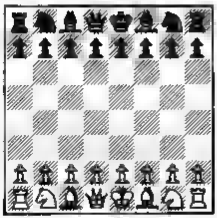

fig 1

The Queen

This is the most powerful piece She can move any number of squares in any direction as long as her path is not obstructed **(fig 3)**

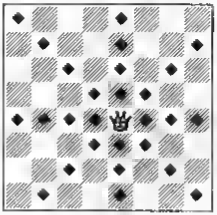

fig 3

The King

The King can move one square **(fig 2)** at a time in any direction He may never move into check (see below)

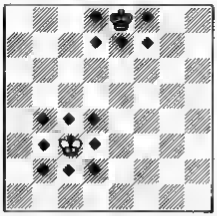

fig 2

The Rook

The Rook or Castle can move any number of unobstructed squares either by rank or by file **(fig 4)**

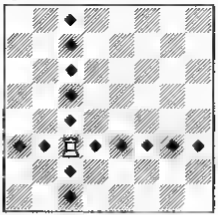

fig 4

The Bishop

The Bishop can move any number of unobstructed squares diagonally **(fig 5)**. If a Bishop is on a dark square he can only reach other dark squares. At the start of a game, each player has a 'dark square' Bishop and a 'light square' Bishop.

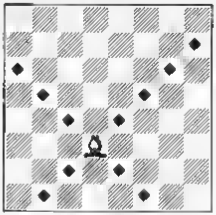

fig 5

The Knight

The Knight's move differs from the others. It jumps from its old to its new square and can leap over other pieces to reach its new position **(fig 6)**. It always lands on an opposite colour to the square it leaves. As with other men, a Knight captures by occupying an opponent's position.

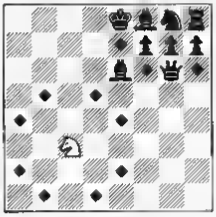

fig 6

The Pawn

The Pawn moves straight ahead only **(fig 7)**, but captures diagonally. It moves one square at a time but on its first move has the option of moving either one or two squares. In **fig 7** the white Pawn has yet to move from its original position, therefore has a two square option. The black Pawn may only move ahead by one square.

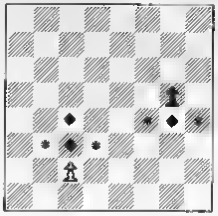

fig 7

Pawn Promotion

If a Pawn successfully advances to the opposing rear rank, it achieves promotion. It can remain a Pawn but the player may replace it with a more powerful piece. By assuming the powers of a more powerful piece, the promoted Pawn can immediately attack (check) the opponent's King.

SPECIAL MOVES

En Passant

This is a special Pawn capture and literally means "in passing". The opportunity arises when a Pawn, that is making its initial move, elects to move two squares forward, as if to avoid capture by the opponent's Pawn. The opponent can then capture, as if the Pawn had moved only one square. If the option to capture is not exercised immediately, the En Passant opportunity is lost. **Fig 8** shows white with a possible En Passant advantage.

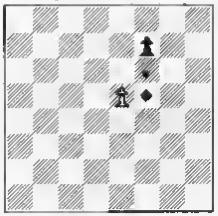

fig 8

Castling

Each player may "Castle" once during a game. Castling is a special move which allows the player to move two men at once — King and Rook — and is only available if special conditions are met. The effect of the move is to put the King into a safer position and allow the Rook more mobility. Either Kingside or Queenside Castling is permitted (see fig 9)

The conditions for Castling are

1. Neither the King nor Rook involved may have moved since the start of the game
2. There may not be men of either colour between the King and Rook involved
3. The King may not Castle out of check, through check or into check

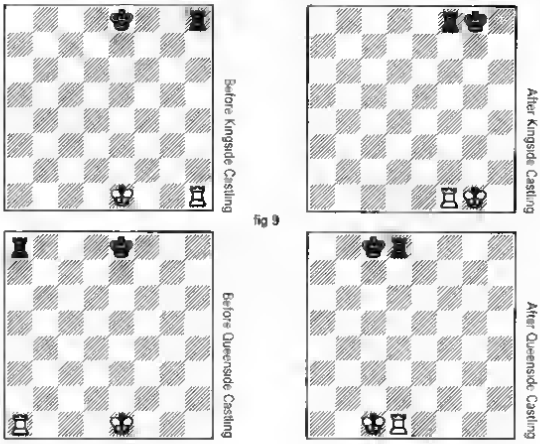

fig 9

Check and Checkmate

If a King is placed in a situation where, at the next opponent's move, it could (had it been another piece) be captured. It is said to be in check. A King may never move into check. When a King is placed in check by the opposing side, the player must either

1. Capture the attacking piece
2. Obstruct the attacking piece
3. Move the King out of range of the attacking piece

If none of these is possible, the King is checkmated and the opposing side wins.

Stalemate

If a player can make no legal move without bringing his King into check, the situation is called Stalemate and the game is considered a draw.

The Art of Chess is controlled entirely from menu options and from on-screen gadgets

Loading The Art of Chess

Mount The Art of Chess disk in Drive DF0 (the built in drive) and depress the CTRL key, the key and the key all at the same time. After a short time the title screen will appear followed by the main chess display showing the chess board and pieces

The Art of Chess is now ready for your instructions

Selecting From The Art of Chess Menue

To display a menu option press the right hand mouse button. You should see the following at the top of the screen

Project Play Edit Special Clocks Sound

These are the main menu headings. Now with the right button still down, move the arrow over one of the headings. A list of options will appear under the heading you have selected. As you move the arrow down the list, the options will be highlighted in turn. In some cases a further list of 'sub options' will also appear. To select an option or sub option, release the right button while that option is highlighted

Playing A Game

The first two options under **Project** are

Start Game with Amiga White
Start Game with Amiga Black

To start a game, all you have to do is select one of these. You can do this at any time, even when a game is in progress. Of course, if you do this without saving (see later) any current game will be lost

When you start a game, the chess pieces will arrange themselves in the opening position on the board

Moving A Piece

To move a piece, place the arrow over the piece you wish to move and press the left hand mouse button. With the button still down, drag the piece to a new square and release the button. If the move is legal, the piece will position itself in the centre of the square and the Amiga will start thinking about its reply. If the move is illegal, the piece will jump back to the square it came from

Promotion

Occasionally The Art of Chess can so far forget itself as to allow you to promote a pawn. If this should ever happen silhouette images of the major piece will appear on the display. Simply click (left button) over the piece you wish to promote to

Castling

When a castling move is legal you can effect the move by moving the king only to the target square. The Art of Chess will complete the operation by moving the castle for you

The Commentary Line

During the course of play and whenever you select a gadget or menu option, the top line of the screen will display a message indicating the current state of the machine. The Commentary Line gives

information such as when it is your move, when you are in check and so on as well as brief instructions on the use of any selected option

The Time Travel Gadget

On the right hand side of the board towards the top of the screen is an arrow like object as illustrated in fig 10 This is the Time Travel Gadget The Time Travel Gadget allows you to move backwards and forwards through any game in progress taking back or restoring moves

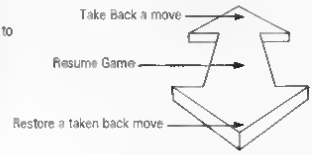

fig 10

Taking Back Moves

To take back the last move (yours or the Amiga s), position the pointer over the part of the arrow pointing away from you and hit the left mouse button To restore a taken back move use the same procedure but this time select the part of the arrow pointing towards you

When you use the Time Travel Gadget the game in progress is temporarily halted When you are satisfied with the state of the board press the left button with the arrow over the middle part of the Time Travel Gadget and play will be resumed

The Time Travel Gadget can be very useful not only for taking back moves If you have been looking away from the screen when the Amiga last moved, simply activate the **take back, restore** and **resume** buttons to replay the move

The Time Travel Gadget is also used to browse through a saved or library game (see later)

Chess Analysis

In using The Art of Chess Analysis options, you have complete freedom to invoke the full power of the Chess Processor at the heart of The Art of Chess software

You can solve chess problems start a game from a particular position or let the processor run for hours to find the best move from a tricky position The Art of Chess gives you the basic tools how you use them is up to you

Here are the facilities you will need

For full explanation see the list of menu options at the end of this manual

1. The Time Travel Gadget which lets you move backwards and forwards through a move sequence at will (see fig 10)
2. **Start Game** and **Stop Game** menu options
3. The change sides, **Human vs Amiga**, **Amiga vs Amiga**, and **Human vs Human** menu options
4. The chess clocks
5. The **Display Legal Moves** option
6. The **Show How a Square is Attacked** and **Show How a Square is Defended** options
7. The performance meter

8. The **Set Position** options

9 The skill controls

10. The **White to Play** and **Black to Play** options

11 The **Watch the Amiga Think** option

All of these facilities are available at any time, however, no processing will take place until you select one of the Start Game options

To set up a problem, use any of the options 3, 4, 7, 8 and 10

To start processing, use option 2

During processing, use 1, 3, 4, 5, 6, 7, 9, 10 and 11

Analysis Example

The Art of Chess provides so many facilities for analysing chess positions, that this manual can only act as a guide. The following illustrates a simple example of chess analysis

Suppose we wish to set up a chess position and then begin play with the Amiga playing both sides. Suppose also that we wish to start with black to play

1 Select **Set a Position from Empty Board** from the **Edit** menu

2 Use the mouse to move pieces onto the board into the desired positions

3 When you are satisfied with the position, select **Black to Play** from the **Play** menu

4 Finally, select the Start a Game option from the **Project** menu

As play proceeds, you will be able to move backwards and forwards through moves played so far, using the Time Travel Gadget (see **fig 10**), change the skill controls, alter moves and so on

Changing the Display

The Art of Chess gives you a wide range of choice over the way the board and pieces are displayed. You can change the display at any time, even in mid game. When you experiment with these options (explained below) you will find that it is quite possible to design a display which makes it impossible to actually play a game! Because of this, The Art of Chess gives you a number of standard board views and colour combinations which can be returned to at any time

Standard Board Views

Under the **Special** menu heading, you will find an option called **Change Board**. Move the arrow over this option to display three miniature pictures of the board in various positions. Select one of these pictures in the usual way to see a new view of the board

Standard Colourings

Also, under **Special** is the option **Change Colour**. Move the arrow over this option to reveal a sub-menu giving three standard settings. **Regular, Club** and **Café**

Custom Board Views

The Art of Chess contains an internal 3D model of a real board which can be viewed from any angle. Moving the board around is rather like moving an Amiga window. To view the board from a different position, place the arrow somewhere over the edge of the board and hold down the left button. Immediately you will see an outline of the board. As you move the mouse, this outline will change shape

and position. A left-to-right motion rotates the board and an up and down motion tilts it. When you release the mouse button the new view will be displayed.

Custom Colour Selection

To re-colour the display, select the **Custom** sub option under the **Change Colour** option. Three slider controls will appear at the top of the screen. The sliders work in a similar way to the Preferences colour controls: they adjust the amounts of red, green and blue at a given point on the screen.

To change the colour, use the tip of the arrow to point at the part of the display you wish to colour and hit the left button. The sliders will jump into positions which reflect the current colouring of the part of the screen you have selected. Now use them to adjust the colour.

When you are through colouring areas of the display, hit the OK gadget to remove the sliders.

Designing Your Own Chess Pieces

To do this you will need a copy of Deluxe Paint (TM) from Electronic Arts.

To design a piece, you must design a brush of a specific size which contains the new piece image. On your Art of Chess disk, in the custom pieces drawer, you will find a brush called Piece Pro-Forma. This is simply an area of colour which is the right size for a chess piece. Your piece should not necessarily fill this area completely however, for correct positioning on the board, the base of the piece should sit in the centre of the bottom edge of the brush.

You may use up to four colours in the design of your piece and these must be colours 13, 14, 15 and 16 on the Deluxe Paint medium resolution pallet (see fig 11).

1	9
2	10
3	11
4	12
5	13
6	14
7	15
8	16

fig 11

Once you have designed your piece, save it on the custom-pieces drawer of The Art of Chess disk under the name pawn, knight, rook, bishop, queen or king, replacing the brushes of those names already in this directory.

Once you have redesigned one or more of the pieces, you must complete a simple procedure to install the new images. This is as follows:

1. Use your Workbench disk to start the Amiga in the normal way.
2. Mount The Art of Chess disk in DF0.
3. Double click over The Art of Chess icon to open The Art of Chess window.
4. Now type the command INSTALL.

A new window will appear to give a running commentary on the progress of the installation procedure. When this is finished, the window will disappear. Your new piece(s) are now installed.

Next time you use The Art of Chess and you select **Use Custom Pieces** from the **Project** menu, your new pieces replace the originals. To restore The Art of Chess pieces, simply re-select the option.

In Art Of Chess the menu bar is not actually visible until you press the RIGHT mouse button To select an option from the menu, place the mouse pointer over your hi-lighted option and release the RIGHT mouse button

PROJECT

Start Game With Amiga Black

This option causes a game to begin Normally, the pieces will arranga themselves on the board in the standard opening position However, if you have previously selected one of the Edit options to set up a chess position, play will begin from the position you have set No play can commence unless there are both Kings on the board.

Start Game With Amiga White

This option is exactly the same as above except that the Amiga will play white and you will play black

NOTE: If you have selected the Amiga vs Amiga or Human vs Human option from the Play menu, this position on the Project menu will offer the single option Start Game

Quit/Resign Game

Select this option to quit/resign from a game in progress select it again to remove all pieces from the board

Load New Game

This option allows you either to load one of the Grandmaster games already saved on your Art of Chess disk, or to load a game which you have previously saved In either case, you are asked to type in the name of the game you wish to load For details of the library, see 'The Grandmaster Classic Library' section in this manual. Click the pointer on the text my-game and delete the text. Then type in the game name to be loaded and press return Now select the OK icon below your filename

Save Current Game

Follow the same procedure laid out for loading a file as detailed above When you have done this, all the moves so far in the current game will be saved on The Art of Chess disk

Quit Chess

This option does not itself exit from The Art of Chess, it merely displays instructions for doing so. To quit The Art of Chess, remove The Art of Chess disk and press the CTRL key and the two Amiga keys together. The machine will then be reset and after a few seconds the standard Workbench request screen will appear.

Show/Clear Board Co-ordinates

Select this option to display chess board co-ordinates along the sides of the board To remove the co-ordinates, simply re-select the option

Change Size And Shape Of Board

Once selected, you may drag the bottom right corner of the board and rotate it in any direction

Tournament Rules

Tournament games are played with a chess-clock set a pre-determined move rate, with the moves being recorded Each player is given a certain amount of time on his clock for a given number of moves. The usual rate of play at tournaments is one of the following

A: 40 moves for the first 2½ hours, 16 moves for every subsequent hour (the session lasts 5 hrs)

B: 45 moves for the first 2½ hours, 16 moves for every subsequent hour (session lasts 4 hrs)

C: 36 moves for the first 2 hours, 16 moves for every subsequent hour (session lasts 4 hrs)

D: 40 moves for the first 2 hours, 20 moves for every subsequent hour (session lasts 4 hrs)

E: 50 moves for the first 2½ hours, 20 moves for every subsequent hour (session lasts 5 hrs)

Select one of the sub-options. Type A, Type B, Type C, Type D or Type E to select your choice

Print A Game

When you have selected this option you are presented with the same requestor as loading/saving a game Type in the name you wish to call the printed file and select OK The file is then saved to disk for printing To print the saved file do the following

1 Use your Workbench disks to start the Amiga in the normal way

2 Insert The Art Of Chess disk in the internal drive

3. Double click over The Art Of Chess icon to open the Art Of Chess window

4 Now run the program Print-Game

5. Select the appropriate number 1-3

6. Type in the filename to be printed

Once the file has been printed, the program will end returning you to the Workbench screen It is important that preferences are correctly set-up for your printer (See section 6-1 of your owners manual for assistance on preferences)

Save Graphic Settings

Art Of Chess allows you to manipulate the board in many ways These include rotate, change colours etc. When you use 'Save Graphic Settings', Art Of Chess will save all the parameters that are required to set up the board to how you designed it to look

PLAY

Change Sides

Allows you to swap sides at any time during the game

Human Vs Human

When you start a game (see Project) with this option selected, you can use The Art of Chess display like a regular chess board and play an ordinary game of chess. The Art of Chess will, however, only allow legal moves All the analysis options are still available and you can still use facilities such as Show Legal Moves and Show Attack or Show Defence.

Amiga Vs Amiga

This causes the Amiga to play against itself Unless a game is in progress play will not commence until you select one of the Start Game options Use this option to make The Art of Chess solve problems on its own

Human Vs Amiga

This is self explanatory Unless a game is currently in progress, play will not commence until you select one of the Start Game options

White To Play

This option can be used to tell the Art of Chess that White is to play when a chess problem has been set up or to force a particular side to play when a game (or problem analysis) is in progress.

Black To Play

This option tells the program that it is 'Black To Play'

Force A Move

Use this option while the Amiga is thinking to force the Amiga to make a move You will also need to use it to control the 'no time limit' option (see Change Skill) This option will not always operate immediately

Mountains

Instead of the conventional flat chess board, the 'Mountains' feature introduces mountains onto the board

Suggest A Move

As the title implies, this option makes the Amiga to evaluate your current position and suggest a move. As this is only a suggestion, it is for you to decide if you are going to use it.

EDIT

The three options under this heading let you set up a chess position for later play or analysis.

Set From Empty Board

Clears any pieces from the board.

Set From Opening Position

Arranges the pieces in the standard opening position.

Set From Current Position

Does not change the current board position at all and can be used to 'cheat' by changing the position while a game is in progress.

When you have selected one of these options, you can move pieces around quite freely. To remove a piece from the board, simply move it to the bottom of the screen. It will arrange itself in the row of captured pieces. To place a piece on the board, simply pick it up in the usual way and position it on a square. Once you have set up a position you should let the Amiga know which side is to play first by selecting White to Play or Black to Play under the Project menu. Finally, to start play select Start Game With Amiga White or Amiga Black from the Project menu.

SPECIAL

Change Colours

There are four sub-options available under this option.

Regular: This is the default power-up colours.

Cafe: This is a pre-defined colour setting.

Club: This is another pre-defined colour setting.

Custom: When you select this sub-option, the usual preferences style colour sliders appear on the screen. To select the colour you wish to adjust, position the arrow so that it points to an area of this colour, click the left button and adjust the sliders. Click on OK when you have finished.

Change Board

This option gives you choice of five standard board views represented as miniature pictures of the chess board: three views of a 3D board and two views of a 2D. In addition to these five standard views, there is also a 3D edit view. To use any of the five standard views, just release the right mouse button when you have hi-lighted you choice.

EDIT: You can, however, move the board to any position without selecting a menu option simply by 'grabbing' the edge of the board, just as you would a piece, and dragging it into a new position. A sideways motion causes board rotation and an up/down motion causes tilt adjustment.

Change Skill

There are three preset levels in addition to an editable level. The editable level appears with two slider controls. The slider marked 'skill' adjusts the length of time the Amiga is, on average, to be allowed for a move. The scale runs from 6 seconds to 3.2 minutes with a no limit time setting at the end of the scale. If you move the slider into the no time limit area, The Art of Chess will never make a move until you select 'Force a Move' from the Play menu. You can use this facility to allow the Amiga to think overnight or longer about the tricky position. The second slider marked 'Aggression' changes the level of aggressiveness displayed by The Art of Chess. A middle setting produces an average style game. Click on OK when you have finished.

Show Legal Moves

To display the possible moves for a particular piece select this option and then click (left button) on a piece. The squares reachable by that piece in a single move will change colour. You will need to select this option for each selected piece.

Performance Meter On/Off

This option displays an on-screen indication of the Amiga's assessment of the current game position. If the meter shows equal amounts of 'black' and 'white', the Amiga considers that black is neck and neck with white. The more of a particular colour shown on the scale, the better the position of that side.

Show Attack

This works just like Show Defence, except that the highlighted squares identify pieces that could capture one of your pieces should it occupy that square.

Show Defence

When you select this option and then click (left button) on a square, certain other squares will change colour. The pieces on these squares 'defend' the square you have selected in the sense that they may capture one of the Amiga's pieces on the selected square in a single move.

Watch The Amiga Think On/Off

This option produces a very revealing graphical display of the Amiga's analysis of the current board position. The areas indicate what The Art of Chess considers the best move, the best reply to that move, the best reply to that reply and so on.

Use Custom/Regular Pieces

This option causes any user defined pieces to be displayed instead of the regular Art of Chess ones. To revert to The Art of Chess pieces, simply select the option again. For further details on customising your pieces, refer to the 'designing your own pieces' section in the gameplay instructions.

CLOCKS

The options under this heading are -

Pause, Start Clock, Stop Clock and Zero Clocks (White, black or both)

The clocks are standard chess clocks. Each one shows how much time that player has used so far in considering his moves.

SOUND

Voice Commentary

This causes the Amiga to speak a commentary on the game and the use of various facilities.

Voice Cuing

In this mode the Amiga announces each move only.

Velvety Silence

This option cancels both Voice Commentary and Voice Cuing.

WARNING: Whenever you save a file on The Art Of Chess disk, make sure the disk is NOT write protected. Otherwise an unrecoverable error will occur.

The following classic games are provided in the **Saved Games** drawer of your Art of Chess disk To load one of the classic games select the **Load Game** option from the **Project** menu When requested type in the name of the game you wish to load The games have names GM1 to GM30 as follows Once a game has been loaded you can use the time travel gadget to browse through the game **(see frg 10)** or start play at any point

GM1	André Dan can Philidor — Captain Smith Paris 1790
GM2	Charles Mahe de la Bourdonnais — Alexander McDonnell London 1834
GM3	Howard Staunton — Pierre Saint-Amant Paris 1843
GM4	Adolf Anderssen — Lionel Kieseritzky London 1851
GM5	Adolf Anderssen — J Dufresne Berlin 1853
GM6	Joseph Henry Blackburne — Amos Burn New York 1889
GM7	Henry Bird — Paul Morphy London 1858
GM8	Johannes Zukertort — Joseph Henry Blackburne London 1883
GM9	Wilhelm Steinitz — Mikhail Tchigorin Havana 1891
GM10	Wilhelm Steinitz — Kurt von Bardeleben Moscow 1895
GM11	Harry Nelson Pillsbury — Emanual Lasker St Petersburg 1895
GM12	Emanual Lasker — Jose Raul Capablanca St Petersburg 1914
GM13	Harry Nelson Pillsbury — Siegbert Tarrasch Hastings 1895
GM14	G Rotterre — Akiba Rubinstein Lodz 1908
GM15	Lewitzky — Frank Marshall, Breslau 1912
GM16	Aaron Nimzovich — Salwe_Carlsbad 1911
GM17	J Corzo — Jose Raul Capablanca_ Havana 1900
GM18	Ossip Bernstein — Jose Raul Capablanca St Petersburg 1914
GM19	Richard Retr — Alexander Alekhine Baden Baden 1925
GM20	Max Euwe — Alexander Alekhine_Zandvoort_ 1935
GM21	Richard Reti — F Gruber Vienna 1923
GM22	Paul Keres — Mikhail Botvinnik Moscow 1941
GM23	Paul Keres — Vasily Smyslov Zurich 1954
GM24	Mikhail Botvinnik — Vasily Smyslov Amsterdam_ 1954
GM25	Mikhail Tal — Gideon Barczq Sofia 1962
GM26	Tigran Petro an — Mikhail Botvinnik Moscow 1961
GM27	Bor s Spassky — Dav d Bronstein_ Leningrad 1960
GM28	Donald Byrne — Bobby Fischer New York 1956
GM29	Bor s Spassky — Bobby Fischer Rejkjavik 1972
GM30	Victor Korchnoi — Anatoly Karpov Bagvio City 1979

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